



Air Force Research Laboratory|AFRL

Science and Technology for Tomorrow's Air and Space Force

Success Story

PROPULSION DIRECTORATE ENGINEER HONORED WITH TOP AIR FORCE AWARD



The Air Force recently awarded Ms. Kathleen Sargent, a Propulsion Directorate engineer, with the 2002 Air Force Science and Engineering Award for Manufacturing Technology. She was recognized for her exceptional work in the development of turbine engine composite components and materials as well as the successful demonstration of a new design concept—a metal matrix composite (MMC) remote ring compressor rotor.



Air Force Research Laboratory
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Accomplishment

Ms. Sargent was responsible for bringing the design concept of the remote ring rotor to fruition by creating and leading a government and industry panel to address the shortcomings of this technology area. As a result of her efforts, the directorate devised a new method for fabricating the rings and successfully demonstrated the feasibility of the remote ring compressor rotor concept.

This concept, which allows the use of two MMC rings at the bore without embedding them into the monolithic rotor material, has a number of advantages over the state of the art. Among these advantages are dramatic increases in material strength and temperature capability, reduced weight, and a major fabrication simplification that reduces production and maintenance costs by more than 10%. This technology is vital to meeting the Phase III goals of the Integrated High-Performance Turbine Engine Technology (IHPTET) program.

Background

The IHPTET program is an ongoing national program aimed at doubling the US military's 1988 propulsion capability. IHPTET is successfully completing its second of three phases toward achieving very aggressive goals.

To date, through coordinated Department of Defense and industry effort, IHPTET has validated numerous revolutionary propulsion technologies that provide durable performance with low production and maintenance costs for the US military's newest fighter systems. These technologies also provide significant upgrade potential for currently fielded systems.

IHPTET is radically changing the way industry designs and manufactures engine components. Structural design innovation is necessary to take full advantage of the advanced materials under development.

The challenge is to produce affordable structures that maintain their robustness while operating at increased temperatures. Designers require aluminides and new alloys that extend the operating temperatures of metallics to meet these challenges, along with advanced composite and non-metallic materials like the titanium metal matrix composite remote ring compressor rotor.

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-PR-18)